

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SPECIFICATION

INVENTION: **METHOD AND SYSTEM FOR FACILITATING ENTRY INTO
OR OUT OF A MOTOR VEHICLE**

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METHOD AND SYSTEM FOR FACILITATING ENTRY
INTO OR OUT OF A MOTOR VEHICLE

BACKGROUND AND SUMMARY OF THE INVENTION

[0001] This application claims the priority of German Application No. 100 11 851.8, filed March 10, 2000, the disclosure of which is expressly incorporated by reference herein.

[0002] The invention relates to a method and a system for facilitating entry into or out of a motor vehicle where, after an unlock command, the window of a vehicle door is completely lowered and, after the closing of the vehicle door, the window is completely closed again. The complete lowering of the window takes place after a double unlock command, as well as a subsequent opening of the vehicle door.

[0003] For facilitating the entrance or exit in the case of narrow vehicle surroundings, for example, in narrow parking spaces, it is known, particularly in connection with frameless vehicle doors, to completely lower the window pane of a door. According to a known embodiment, a complete lowering of a door window takes place by a double unlock command, for example, sent by way of a radio key or by way of a command point at the door.

[0004] However, in this approach, it is a disadvantage that every time an unlock command is given twice, the vehicle

window is lowered. It can therefore happen that a vehicle operator accidentally and unintentionally gives the unlock command twice and therefore carries out a complete lowering of the window of a vehicle door without entering the vehicle or even without being in the immediate proximity of the vehicle.

[0005] Furthermore, it is known in the case of frameless doors, particularly in the case of convertibles, to lower the window only a few centimeters when opening the door in order to move the window out of its sealing device. When the door is closed, the window is then moved up again in order to firmly press it against the door sealing device.

[0006] The present invention has the object of further developing the above-mentioned prior art, in which case the system has the purpose of preventing an unintentional opening of a vehicle window.

[0007] This object is achieved by providing a method of facilitating entrance into a motor vehicle, where, after an unlock command, the window of a vehicle door is completely lowered and, after the closing of the vehicle door, the window is completely closed again. The complete lowering of the window takes place after a double unlock command, as well as a subsequent opening of the vehicle door.

[0008] Accordingly, it is essential to the invention that, in addition to giving a double unlock command, the vehicle door must actually be opened. Only then will the window of the corresponding door be lowered completely so that a facilitated entrance into the vehicle will occur. After the closing of the door, the window of the vehicle door will then again be moved completely to the top.

[0009] According to a preferred embodiment, an anti-squeeze device, which is known per se, monitors the closing operation of the window after the closing of the vehicle door.

[0010] According to another advantageous embodiment, the unlock command can be given by way of a remote radio operation or by way of command point at the vehicle door. Suitable command points are, for example, conventional vehicle keys, radio keys or vehicle keys which can emit signals in a coded form in a different manner.

[0011] Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Figure 1 is a block diagram illustrating a very simple embodiment of the present invention; and

[0013] Figure 2 is a flow chart of a method according to the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0014] The system according to the invention, according to the embodiment in Figure 1, comprises an electric window lift mechanism 10, which is acted upon by a control device 12. The control device 12 can be contained as a module in a vehicle control unit which is known per se. It is illustrated separately only for describing the present invention. The control device 12 comprises two inputs, by way of which signals arrive from a door contact switch 14 and the receiver of a remote radio operation 16. By way of a remote control 18, an unlock signal can be transmitted to the receiver 16. The signal is then transmitted by the receiver 16 to the control device 12. Furthermore, the control device 12 receives information from the door contact switch 14 as to whether the vehicle door is open or closed.

[0015] The control device 12 is constructed such that the electric window lift mechanism 10 will be operated for a complete lowering of the window when a double unlock command

is given by way of the remote controller 18 and, simultaneously or subsequently, the door contact switch 14 signals that the door has been opened.

[0016] The completely lowered window then ensures an easier entrance into the vehicle, particularly in the case of frameless doors.

[0017] After the closing of the vehicle door, which is signalled by the door contact switch 14 to the control device 12, the window is then completely moved back to the top by means of the electric window lift mechanism 10.

[0018] An anti-squeeze device, which is known per se and which monitors the closing operation of the window, is not shown in this case. The anti-squeeze device can be integrated in the control device 12 or with the window lift motor 10.

[0019] Naturally, the present invention can also be implemented differently. For example, instead of or in addition to the receiver 16, a command point at a vehicle door can be used. Such a command point can be a conventional but electrically monitored lock. As an alternative, coded keys or encoded points can be used as command points. In addition, for example, instead of the door switch 14, an operation of the door handle can also be detected. In the present

invention, it is only essential that, in addition to a double unlock command, the opening and closing of the door is also detected.

[0020] This is also illustrated in the flow chart shown in Figure 2.

[0021] There, it is checked in step S10 whether a double unlock command is present. If this is not so, a return branching takes place. However, if it is so, the system checks in step S12 whether the vehicle door is opened. If this is not so, a return branching again takes place.

[0022] Otherwise, the window is completely lowered in step S14. Then, it is continuously checked whether the door was closed again (step S 16). If this is not so, a loop takes place back to the start of step S16. However, if the door was closed (yes), a complete closing of the window is caused in step 18.

[0023] As much as possible, the present invention prevents a window from being unintentionally left open.

[0024] The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments

incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.